Wichita Falls
TEXAS
BLUE SKIES. GOLDEN OPPORTUNITIES

Wichita Falls Long Range Water Supply Plan

CITY COUNCIL MEETING
JANUARY 20, 2015

Prepared by:

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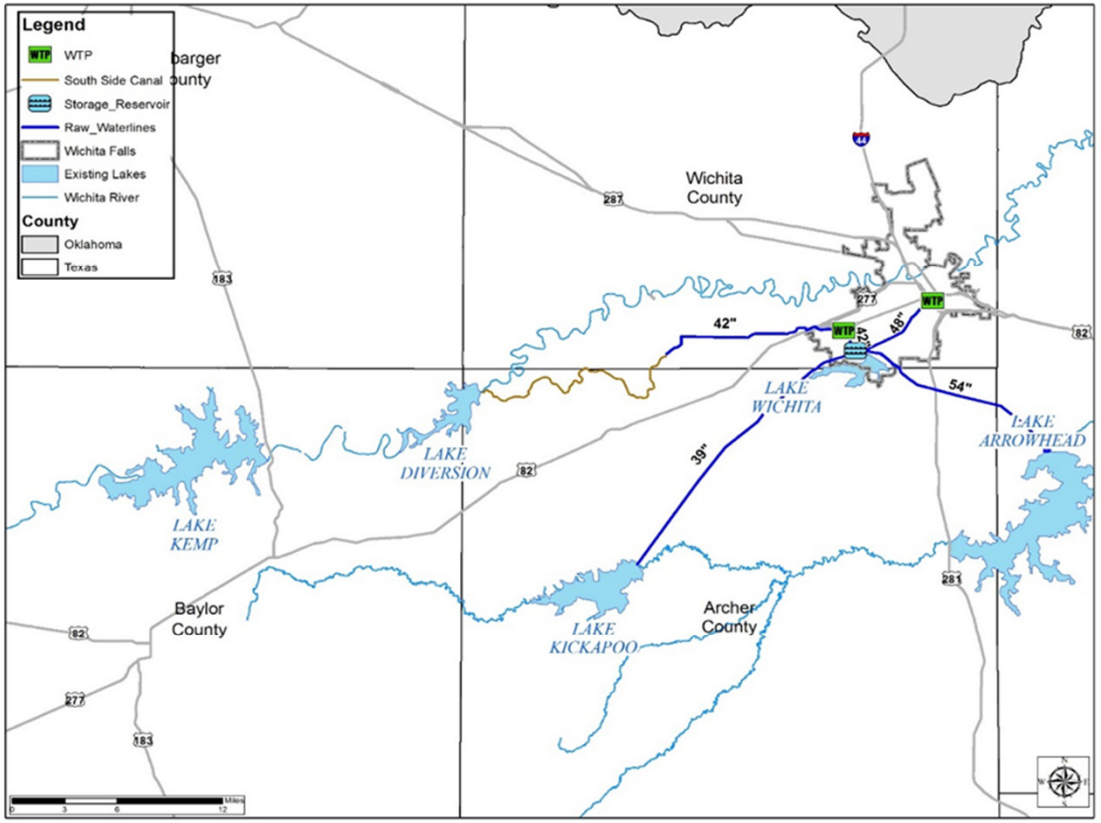
What is a Long-Range Water Supply Plan?

- Long-Term into Future
  - 50+ Year Planning Horizon
- Answers 3 Questions:
  - How much water do we have?
  - How much water do we need?
  - How will we meet our future water needs?

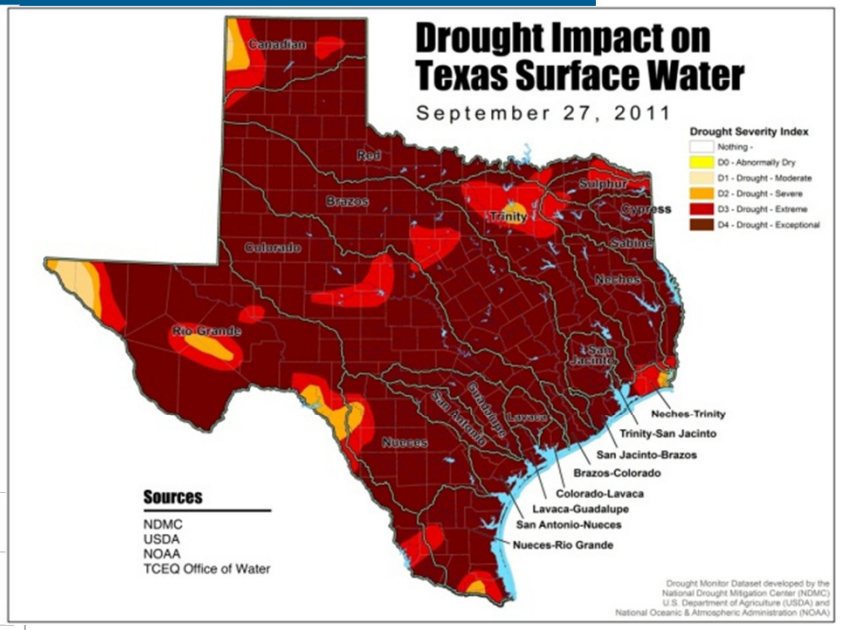
Water Planning Trifecta

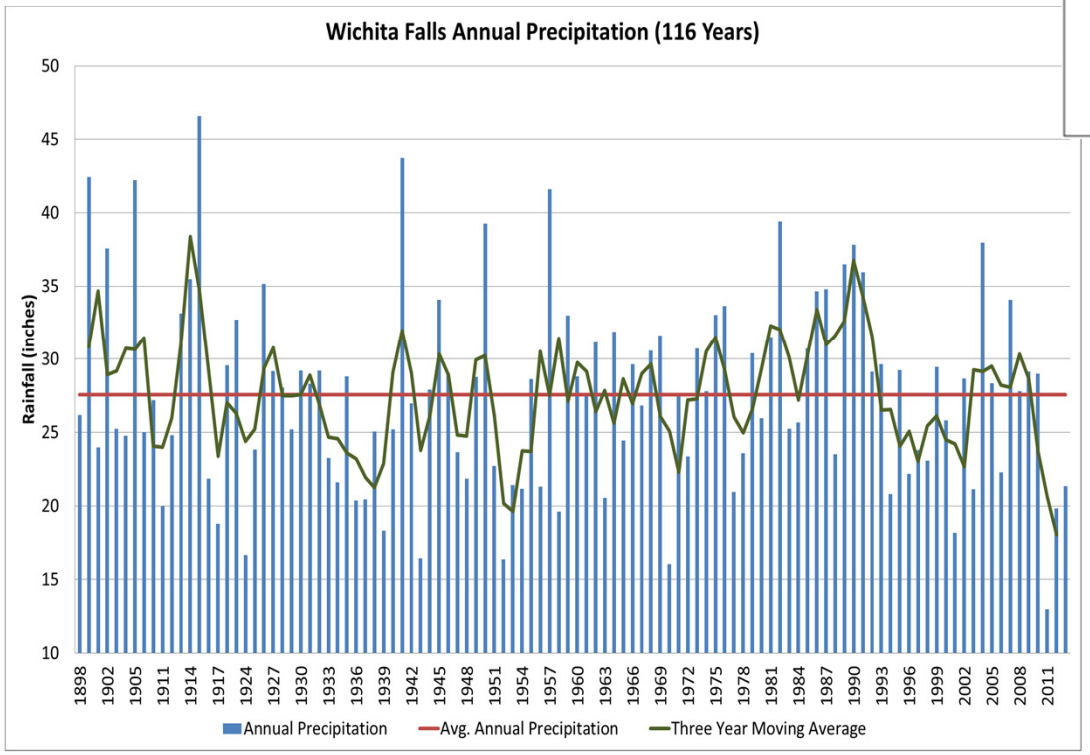
Existing Water Supplies



Impact of 2011 Drought

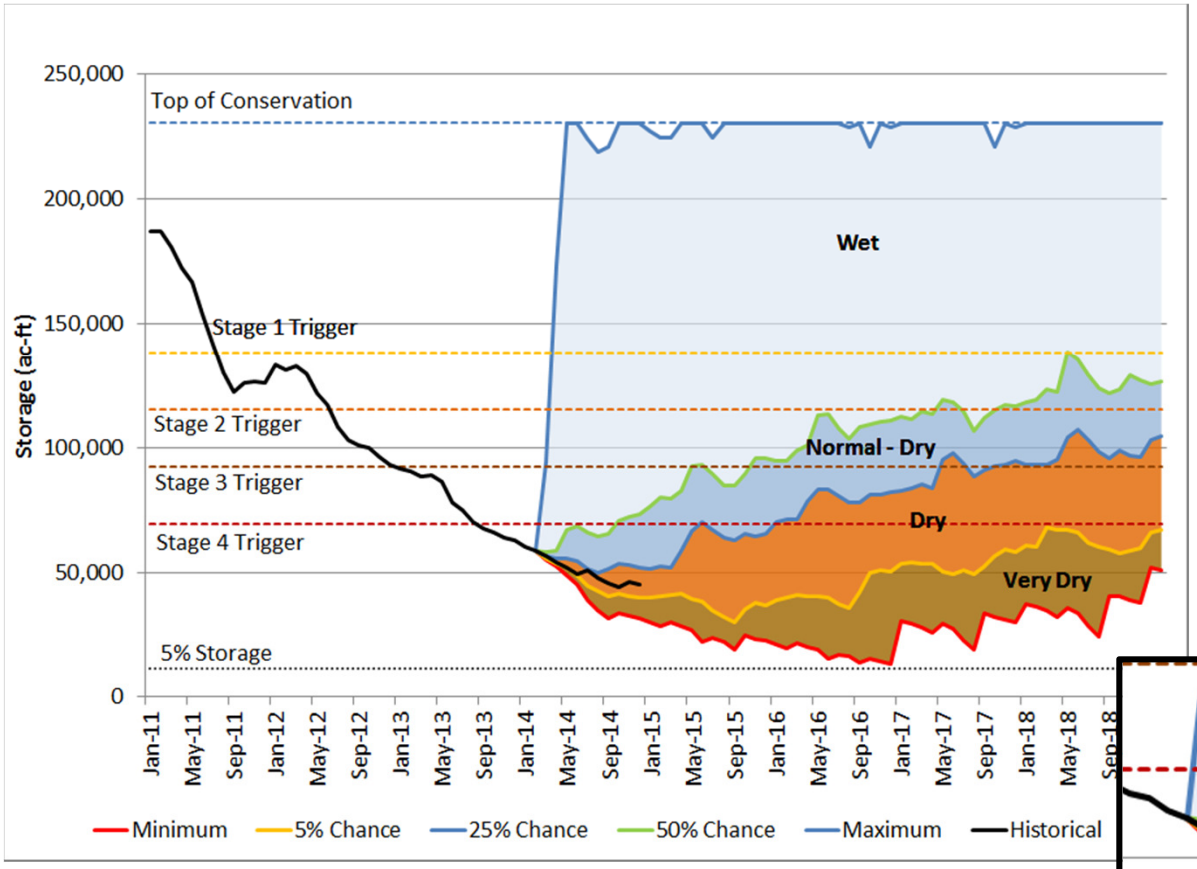
- Increased evaporation
- Decreased inflows
- Low reservoir levels
- Reduced demand
- Temporary supplies



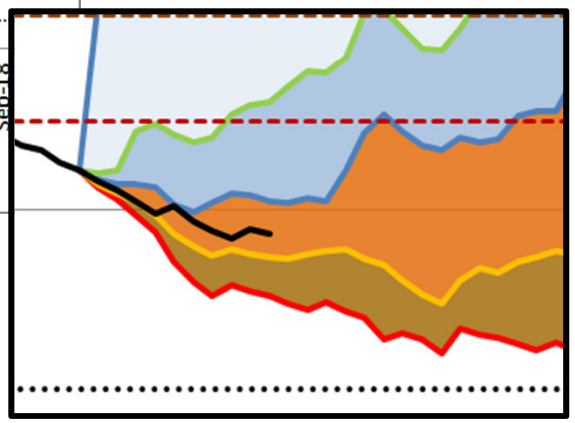


Existing Water Supply Evaluation

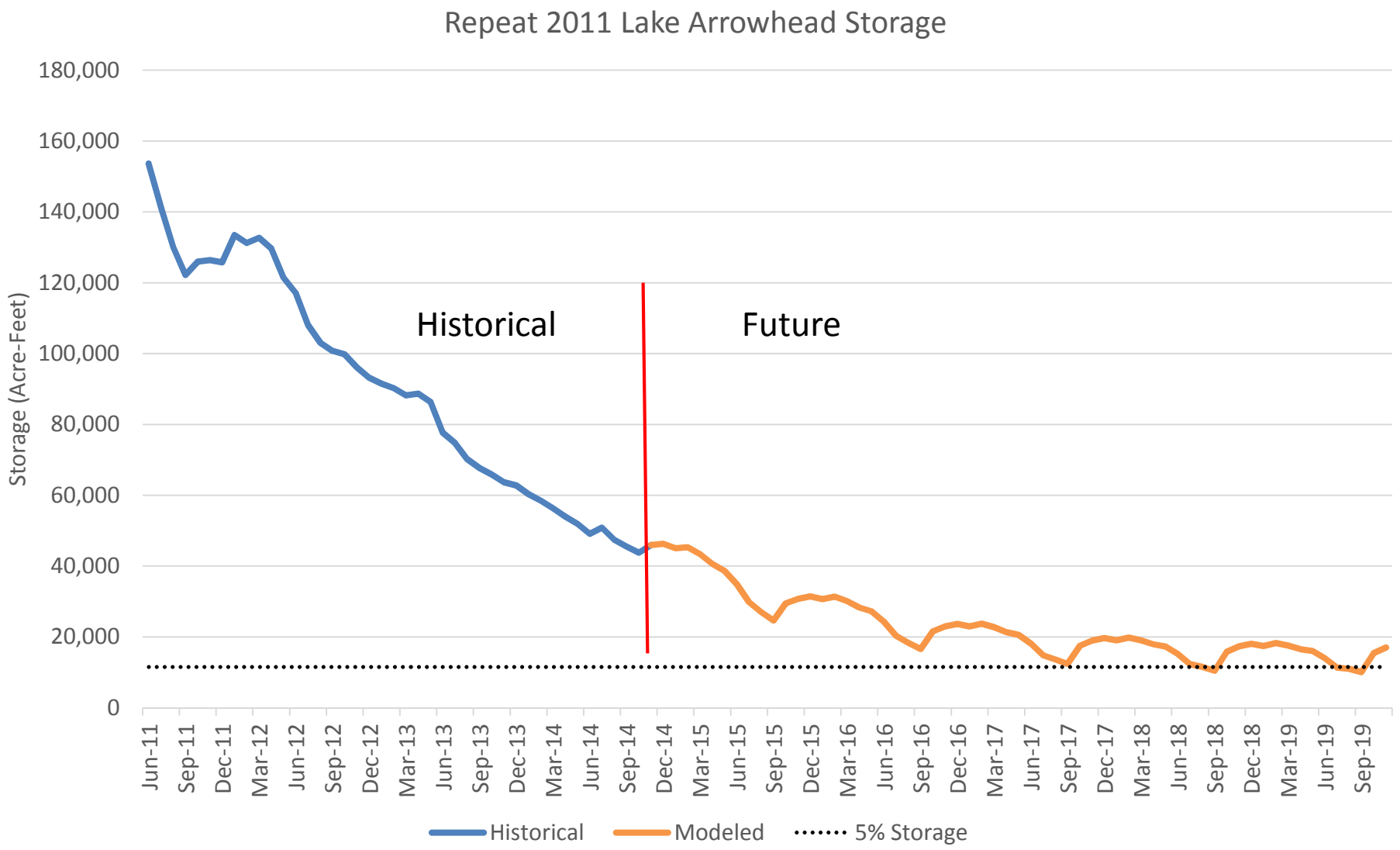
Lake Arrowhead



- Drought has continued through 2014
- Uncertainty as drought continues
- Difficulty in determining supply availability



Existing Water Supply Modeling



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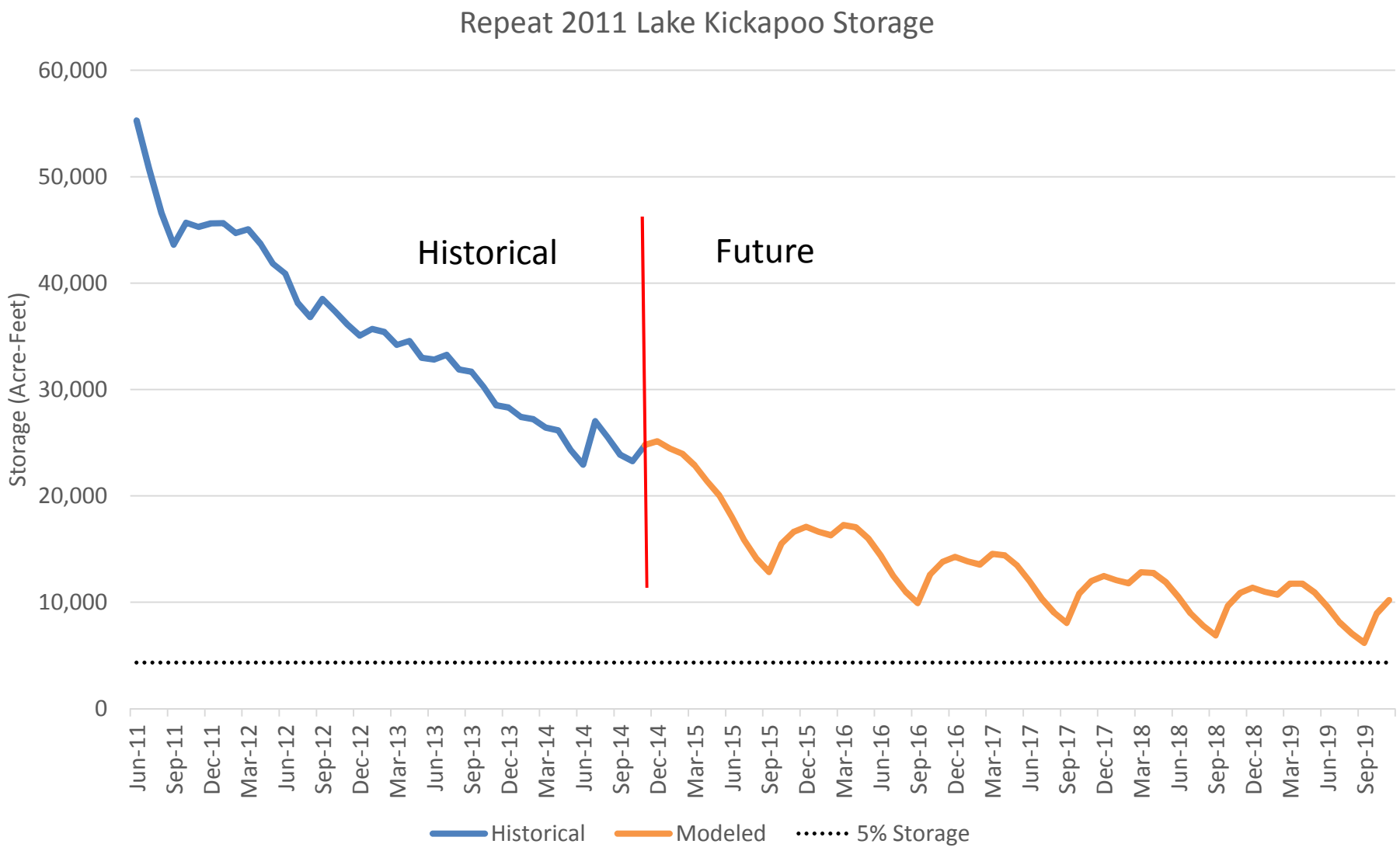
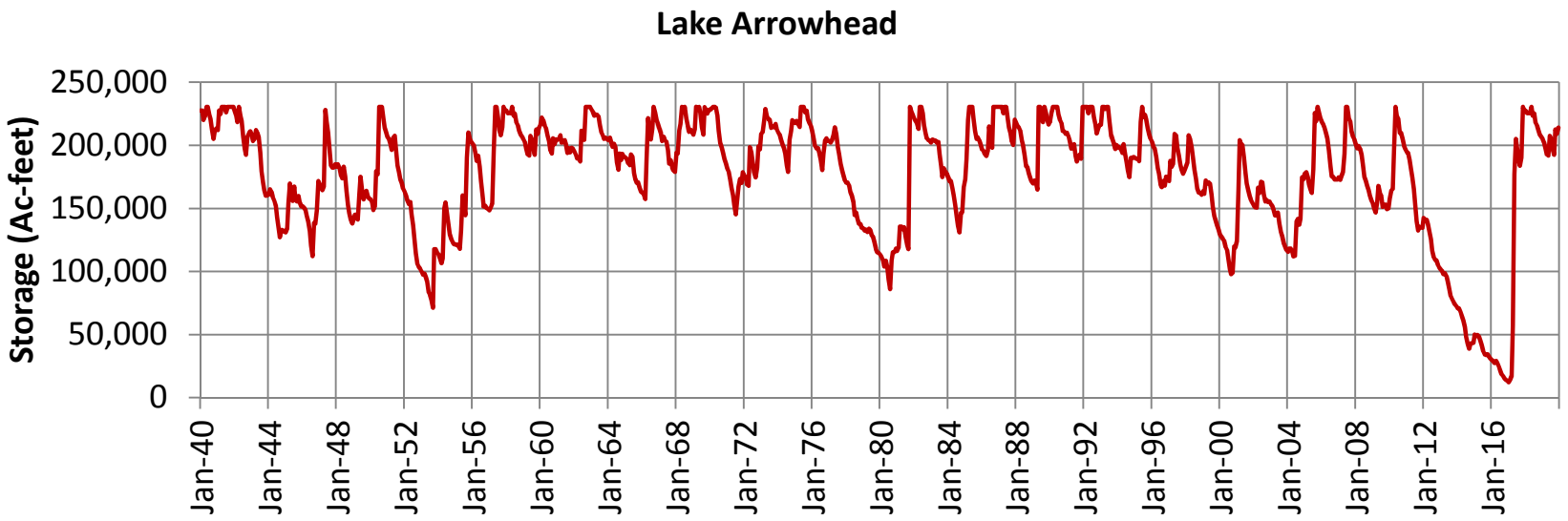
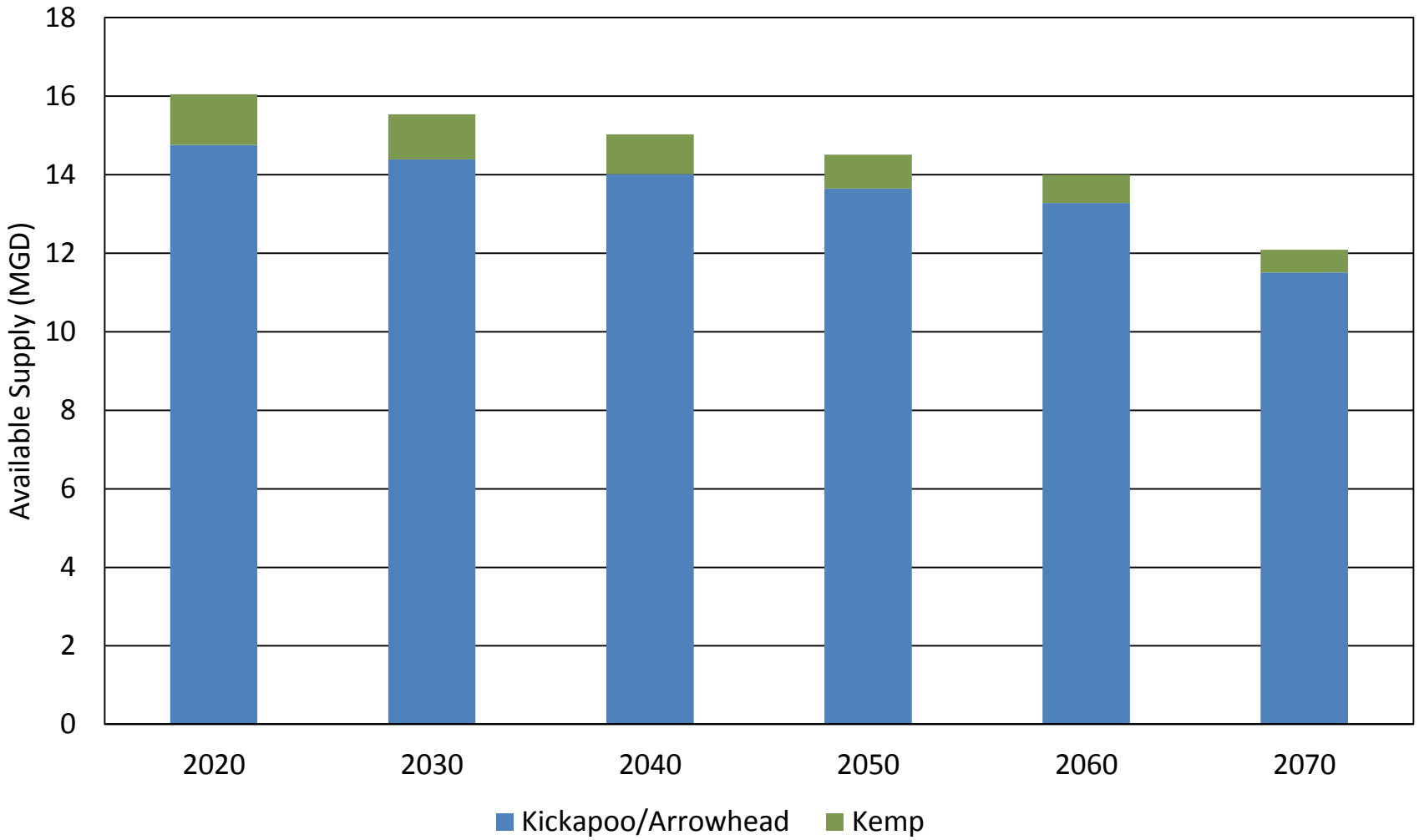


Reservoir Yield Evaluation

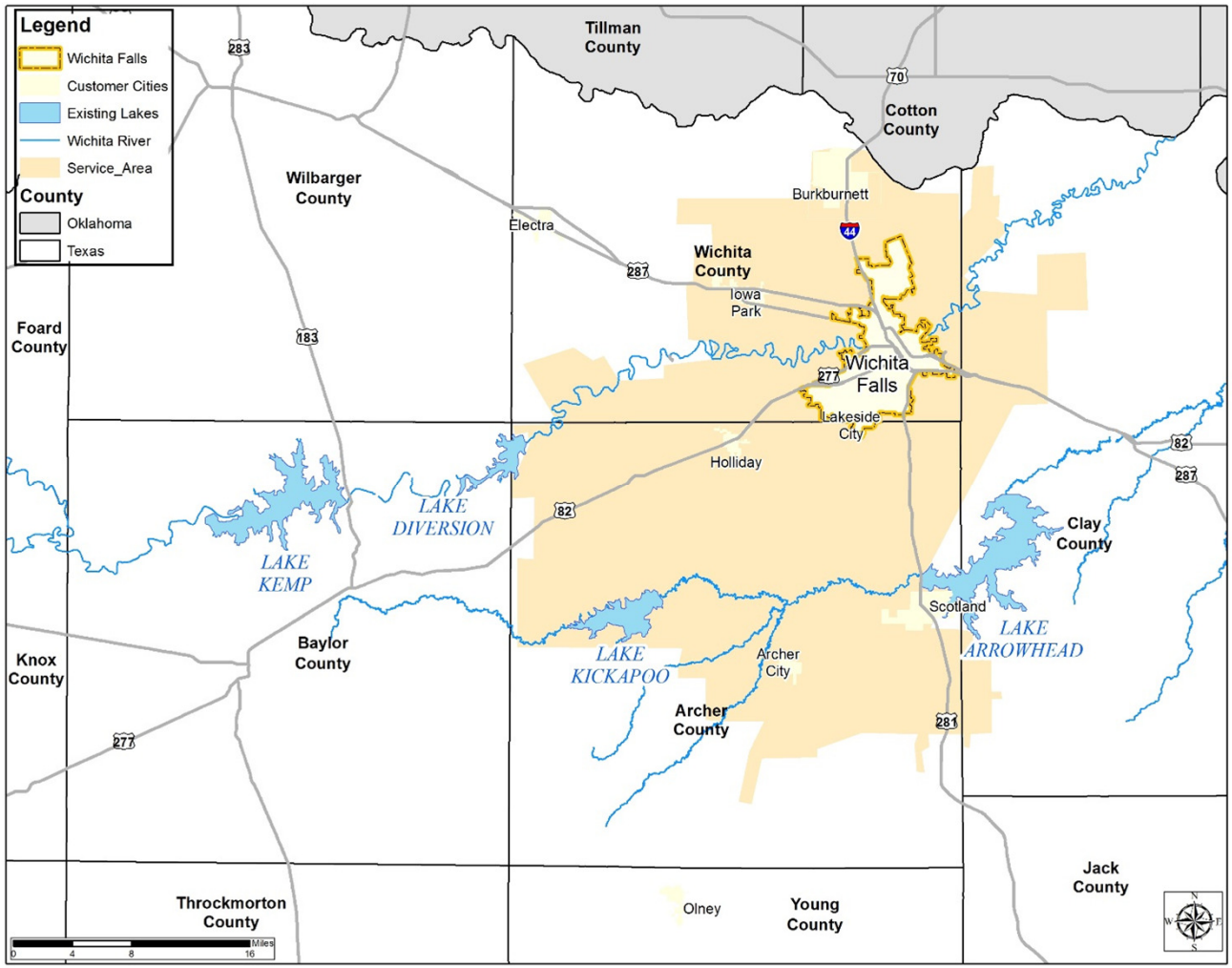
- Yield – Measure of reliable supply from a reservoir
- Assumed drought extends through 2016 to make a conservative effort of supply availability
  - Repeat 2011 - 2013 hydrology in 2014 – 2016
  - Assumes three more very dry years.



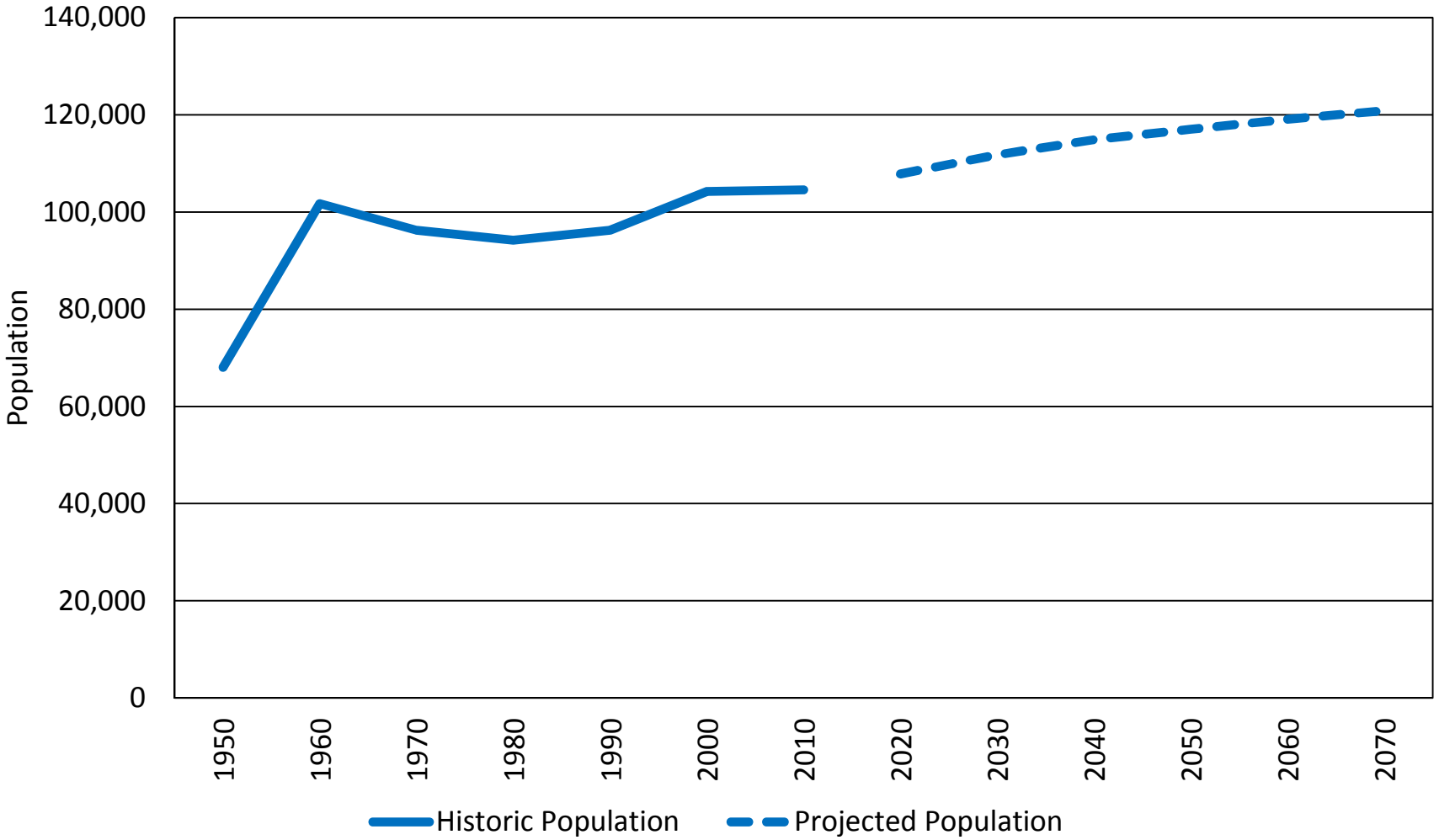
How Much Water Do We Have?



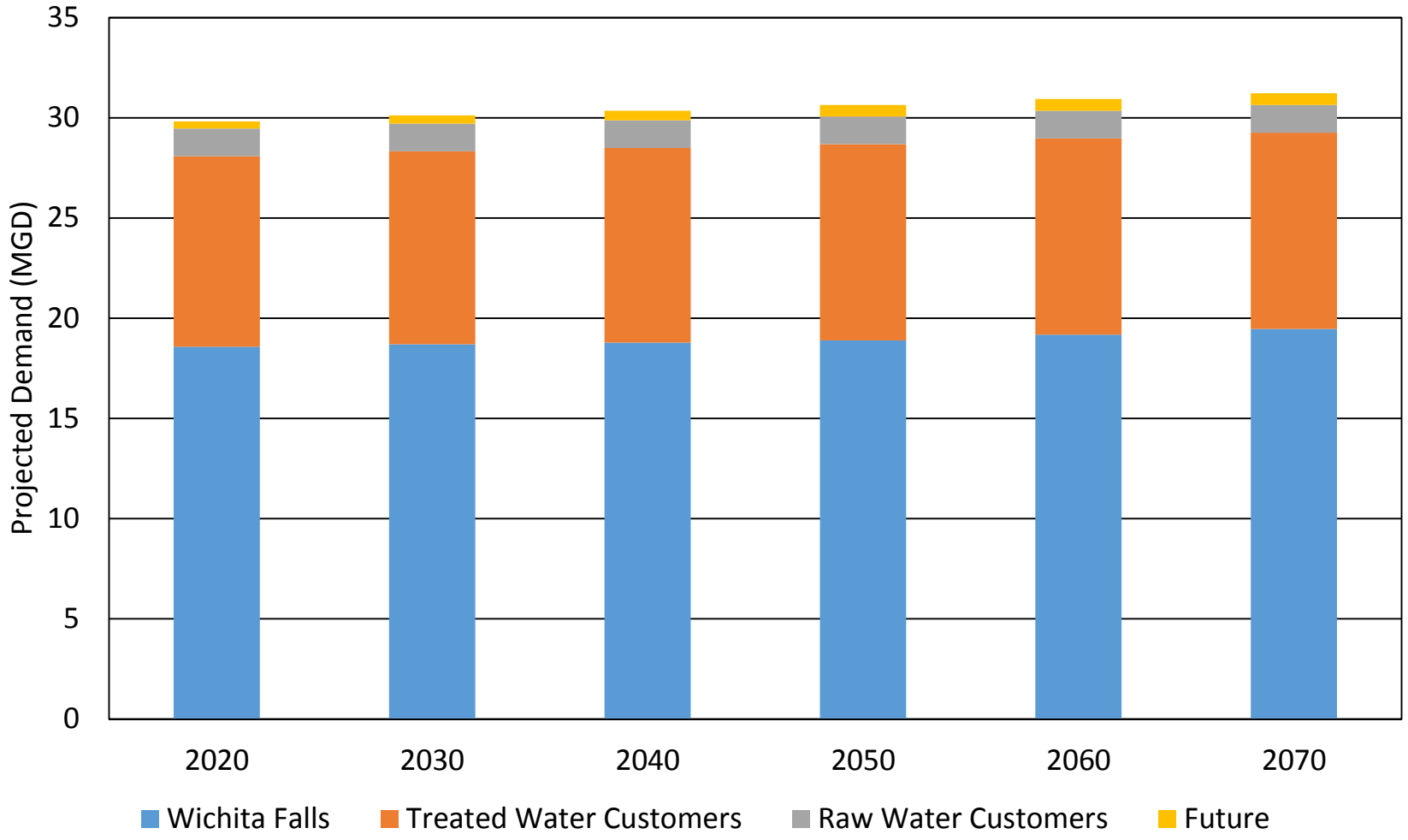
Wichita Falls Service Area



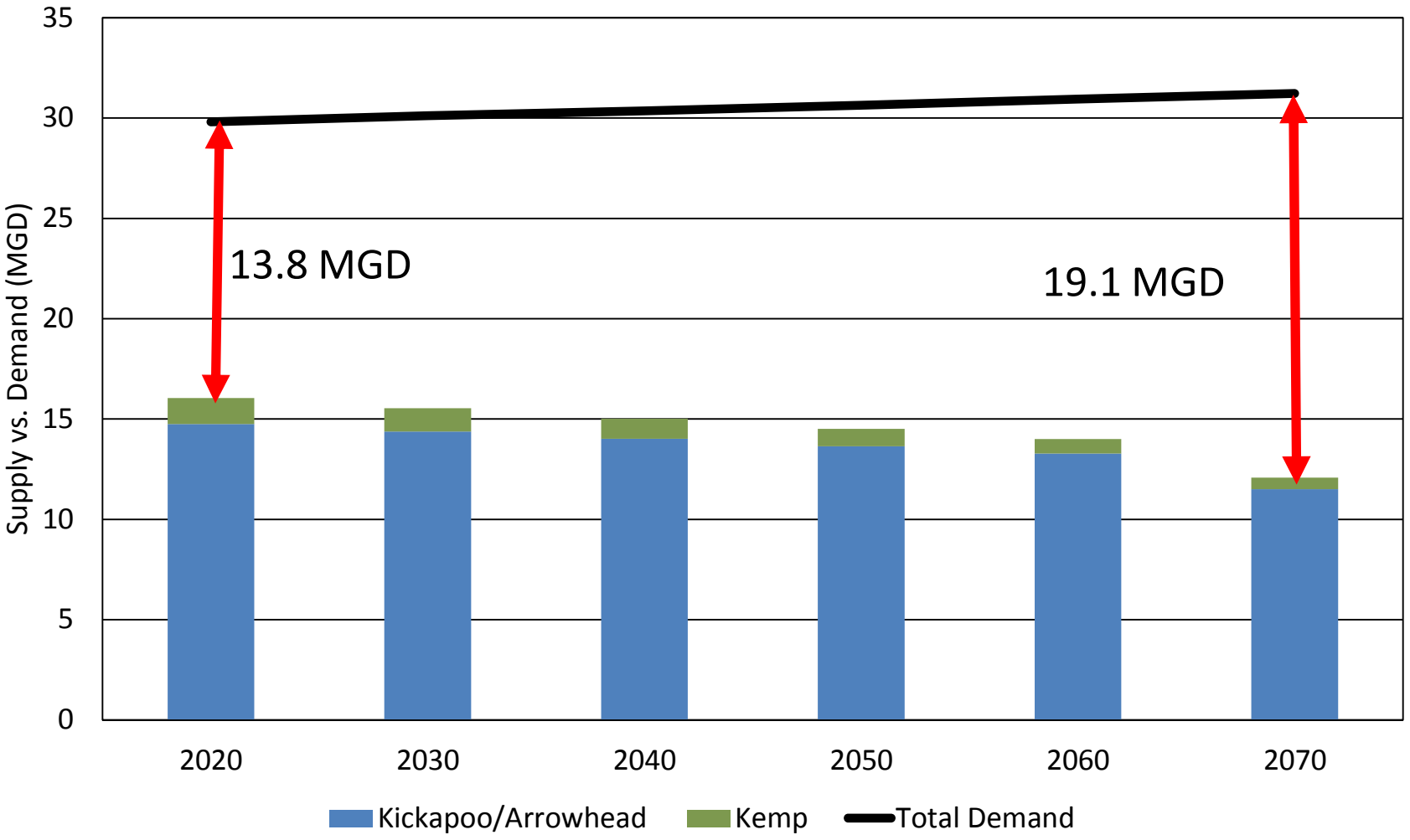
Wichita Falls Population Projection



Water Demand Projections



How Much Water Do We Need?



How Will We Meet Our Future Water Needs?

- Twenty-two strategies evaluated
- Ten criteria
- Water quantity, reliability and potential cost
- Twelve strategies retained for further evaluation

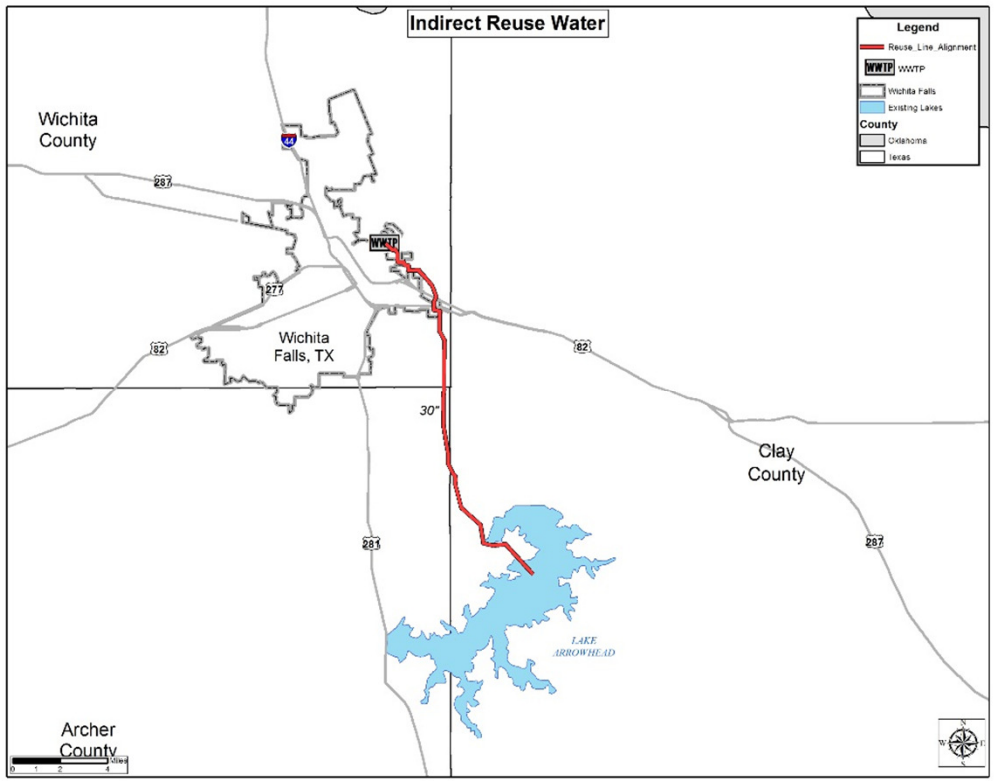
Alternative	Composite Score (max 80)	Rank
Indirect Reuse	72	1
Water Conservation	67	2
Lake Ringgold Water	58	3
Groundwater HFSJ	50	4
Groundwater From Wilbarger County	49	5
Groundwater From Roberts County	47	6
Groundwater From Donley & Gray County	45	7
Wichita River Supply	45	7
Lake Kemp Water Right Amendment	43	9
Groundwater From Denton County	41	10
Lake Texoma Water	41	10
Lake Bridgeport Water	40	12

Criteria for Strategy Analysis

- Water Quantity
- Quality
- Reliability
- Cost
- Regulatory Requirements
- Impacts
- Time to implement
- Development Obstacles
- Supply Independence
- Competition for Water

Indirect Reuse

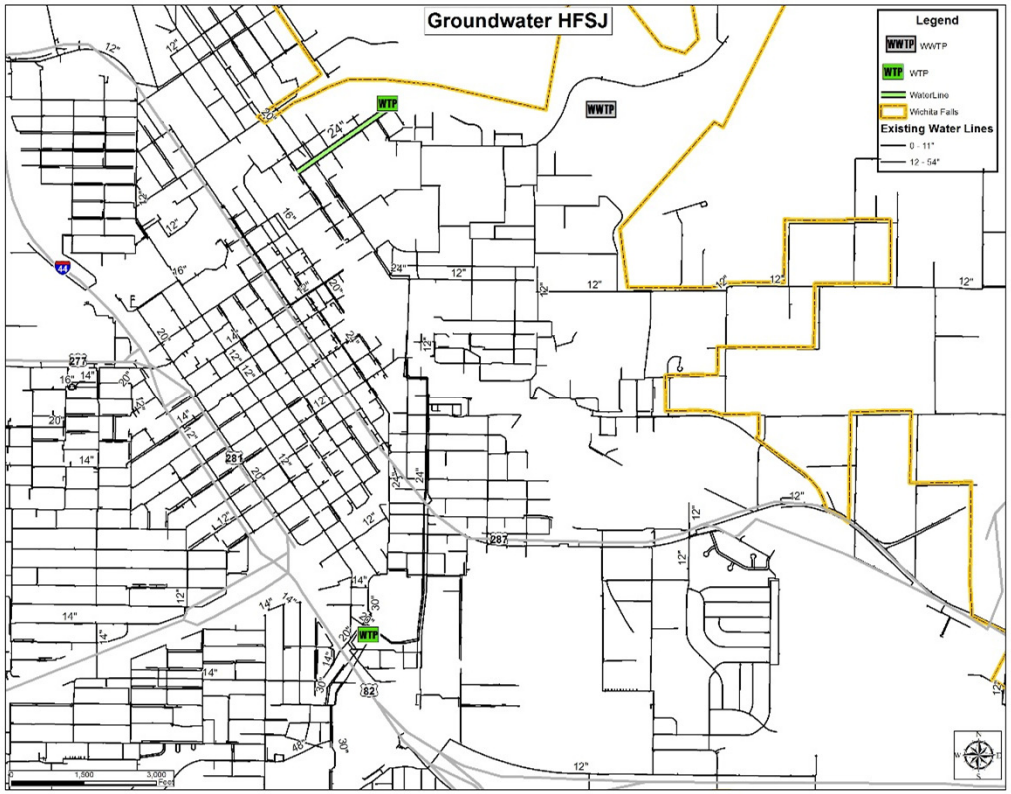
- Strategy Supply
  - 8-10 MGD
- Time to Implement
  - 3 Years
- Capital Cost
  - $36.5 Million
- Unit Cost
  - $1.90/1,000 gallons
- Issues
  - Requires water in Lake Arrowhead



Indirect Reuse

Local Groundwater

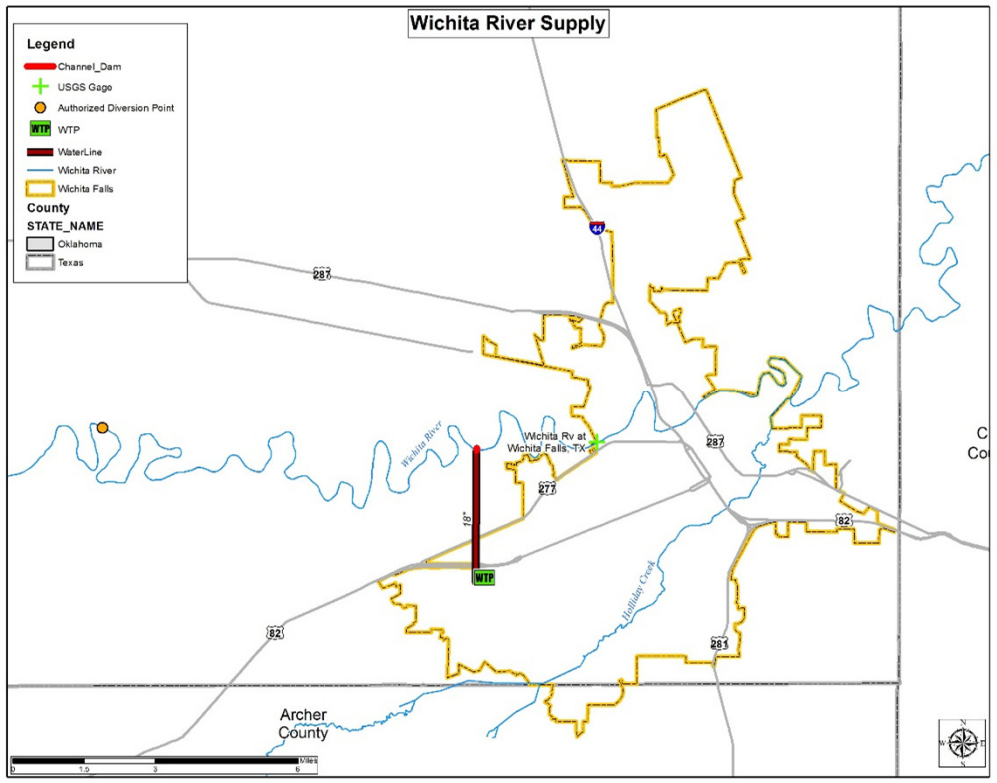
- Strategy Supply
  - 2 MGD
- Time to Implement
  - 3 Years
- Capital Cost
  - $20.8 Million
- Unit Cost
  - $4.64/1,000 gallons
- Issues
  - Reliability
  - Water Quality



Groundwater HSFJ

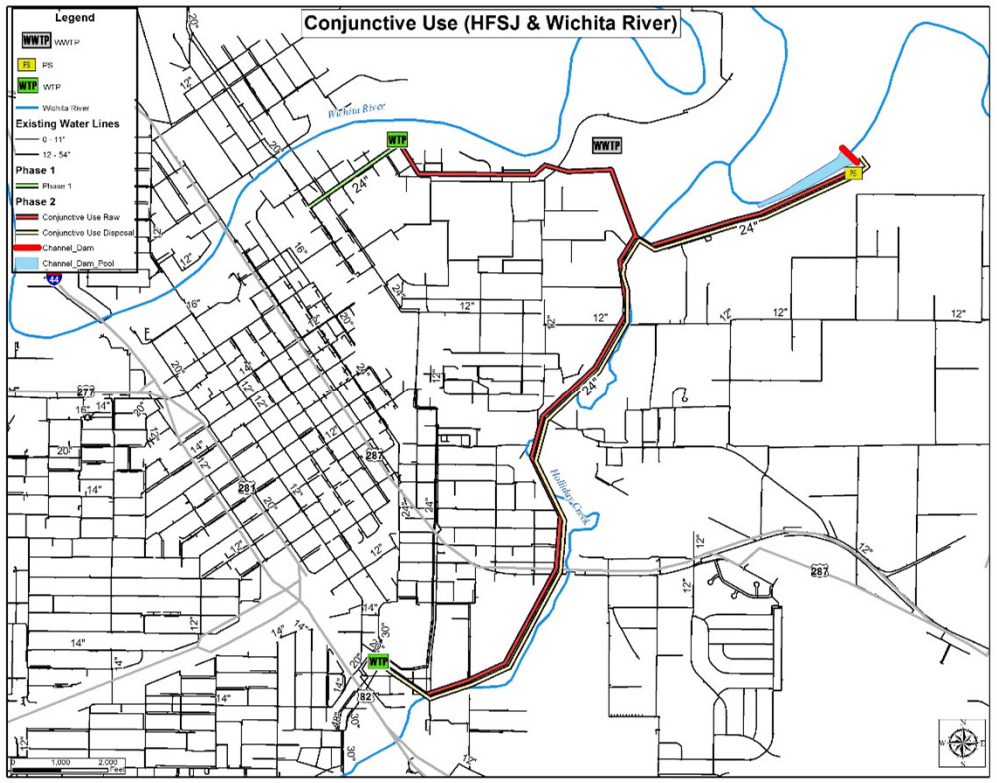
Wichita River

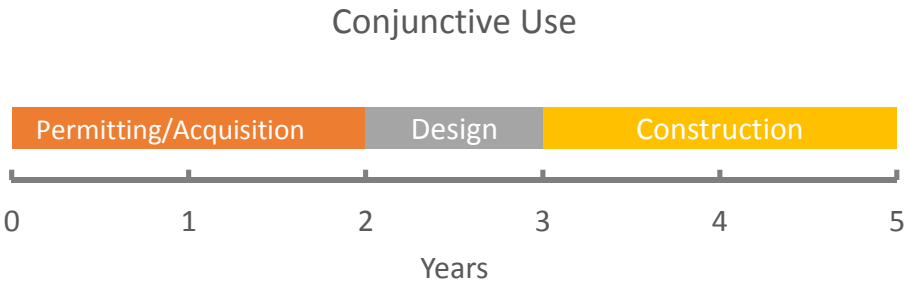
- Strategy Supply
  - 2 MGD
- Time to Implement
  - 4 Years
- Capital Cost
  - $10.4 Million
- Unit Cost
  - $2.33/1,000 gallons
- Issues
  - Reliability
  - Permitting (Water Right)
  - Water Quality



Conjunctive Use

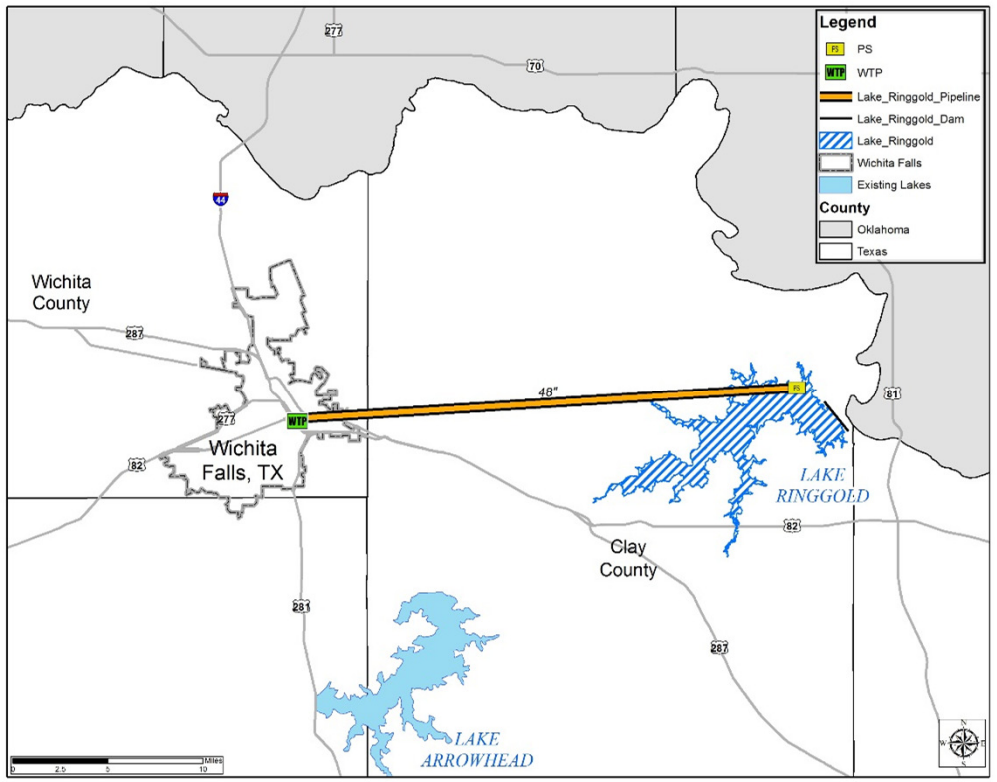
- Strategy Supply
  - 4 MGD
- Time to Implement
  - 5 Years
- Capital Cost
  - $38.4 Million
- Unit Cost
  - $4.39/1,000 gallons
- Issues
  - Reliability
  - Permitting (Water Right)
  - Water Quality

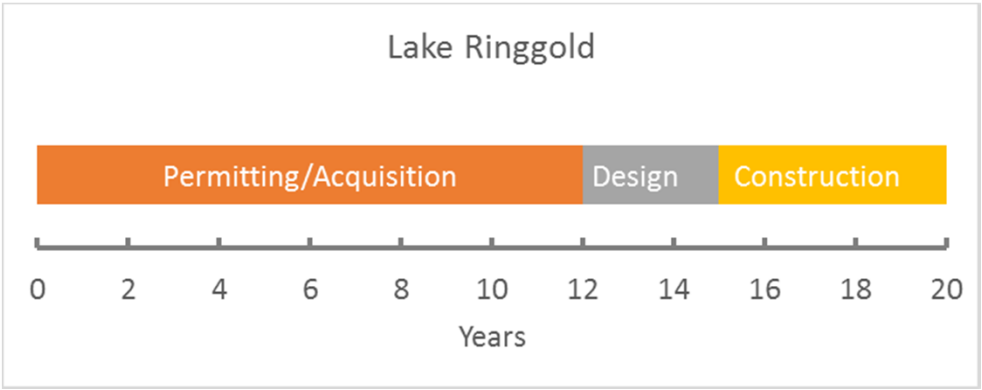




Lake Ringgold

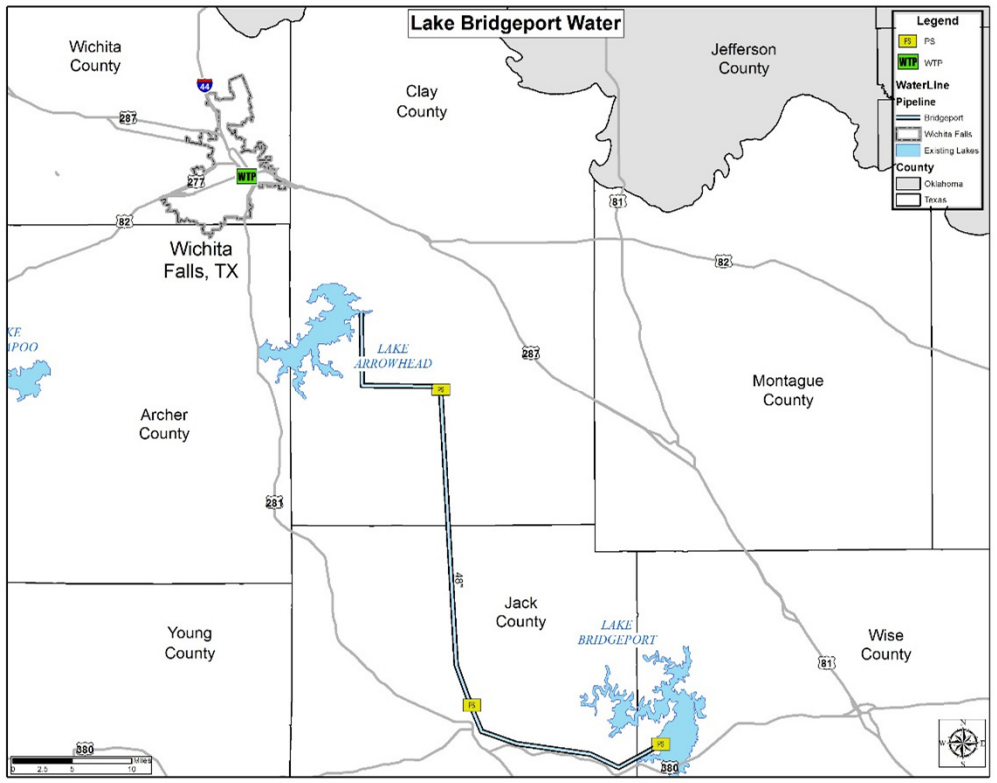
- Strategy Supply
  - 16.6 MGD
- Time to Implement
  - 20 Years
- Capital Cost
  - $297.9 Million
- Unit Cost
  - $4.51/1,000 gallons
- Issues
  - Permitting (Water Right, 404)
  - Time to implement

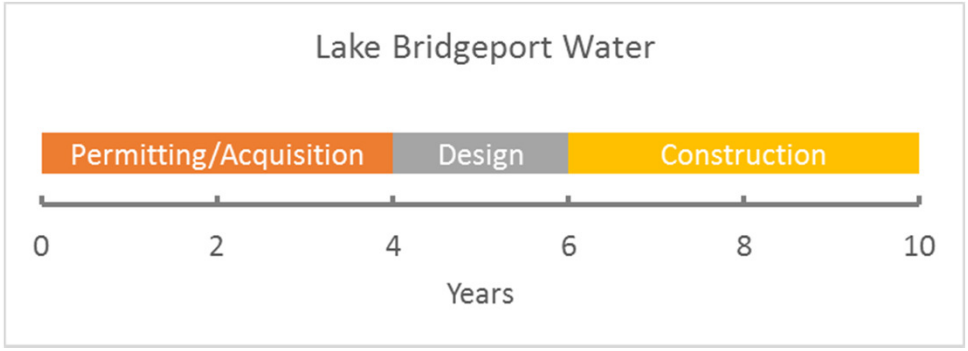




Lake Bridgeport

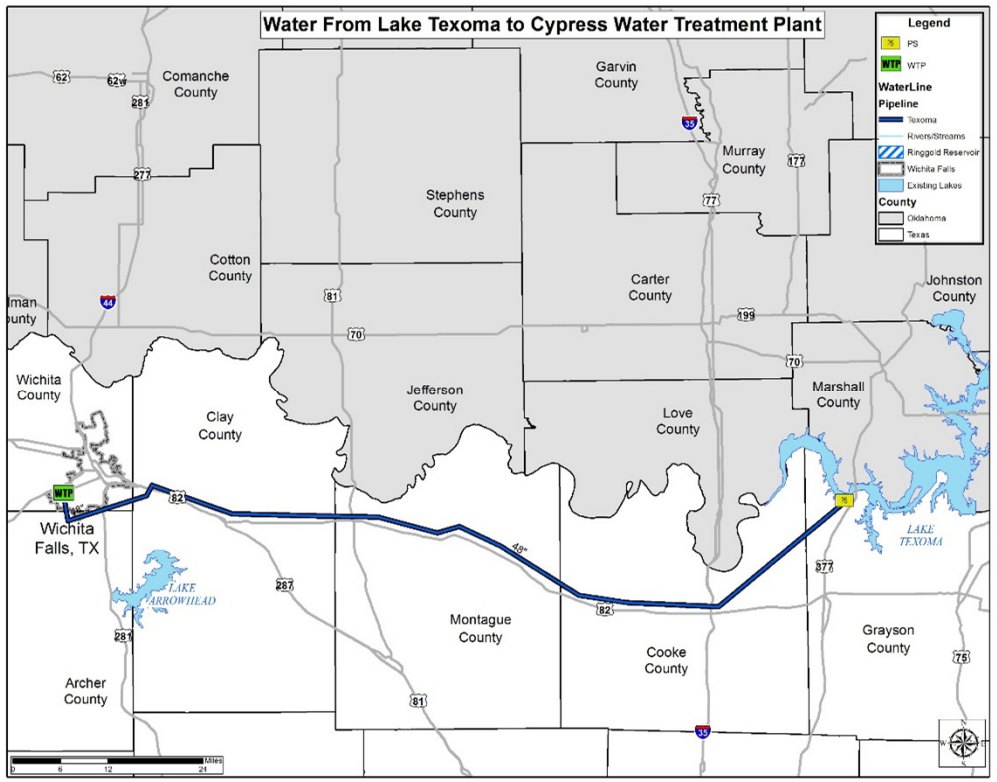
- Strategy Supply
  - 15 MGD
- Time to Implement
  - 10 Years
- Capital Cost
  - $235.2 Million
- Unit Cost
  - $5.06/1,000 gallons
- Issues
  - TRWD Agreement
  - Permitting (IBT)

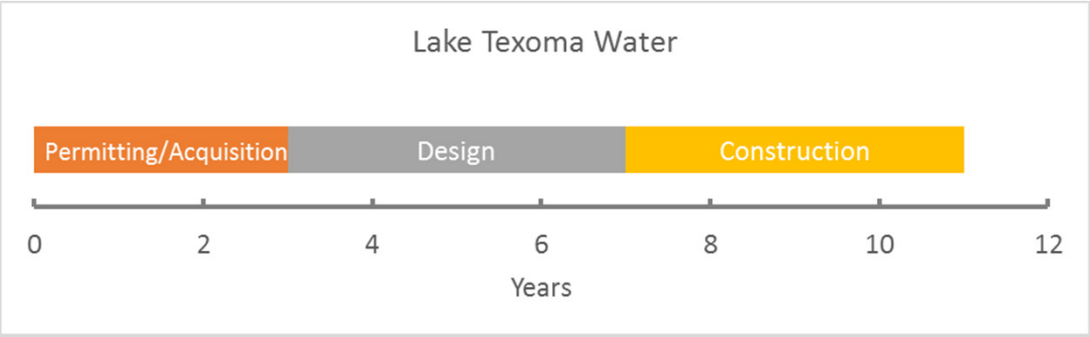




Lake Texoma

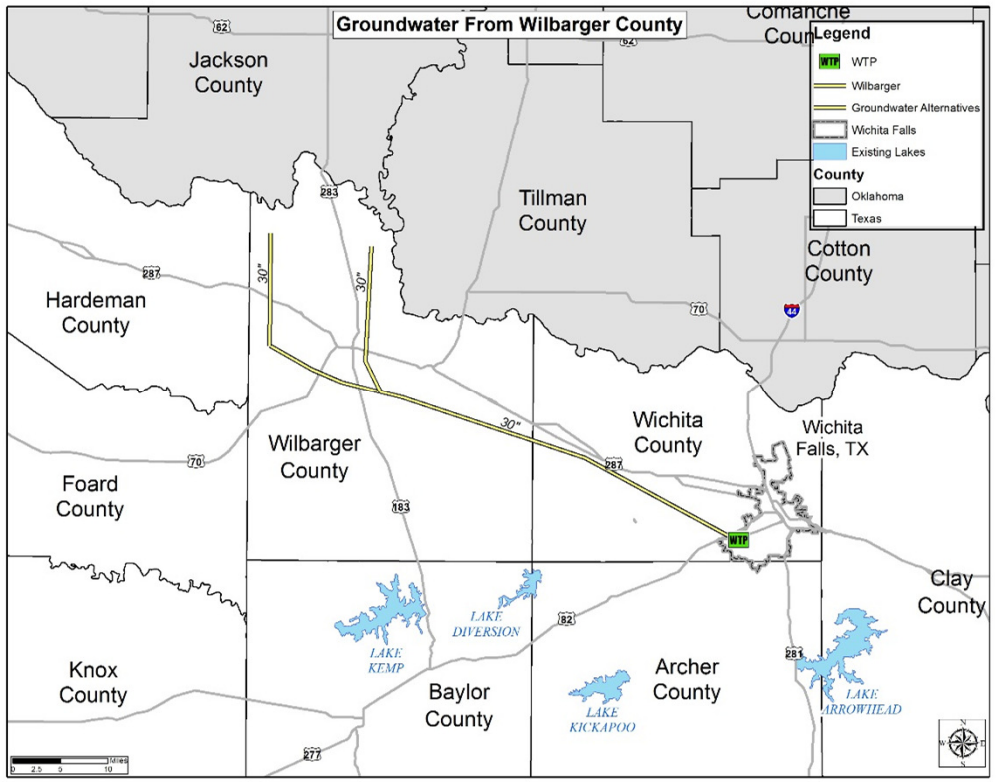
- Strategy Supply
  - 15 MGD
- Time to Implement
  - 11 Years
- Capital Cost
  - $401.2 Million
- Unit Cost
  - $7.66/1,000 gallons
- Issues
  - Water Quality
  - High Costs



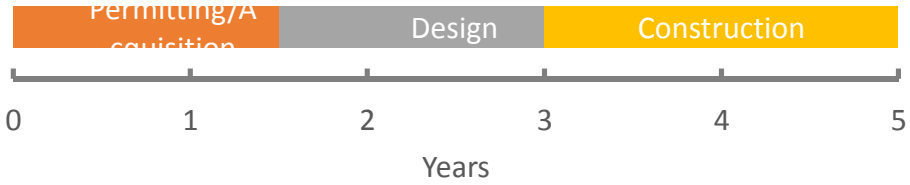


Groundwater - Wilbarger County

- Strategy Supply
  - 5 MGD
- Time to Implement
  - 5 Years
- Capital Cost
  - $107.5 Million
- Unit Cost
  - $6.53/1,000 gallons
- Issues
  - Reliability
  - Water Quality

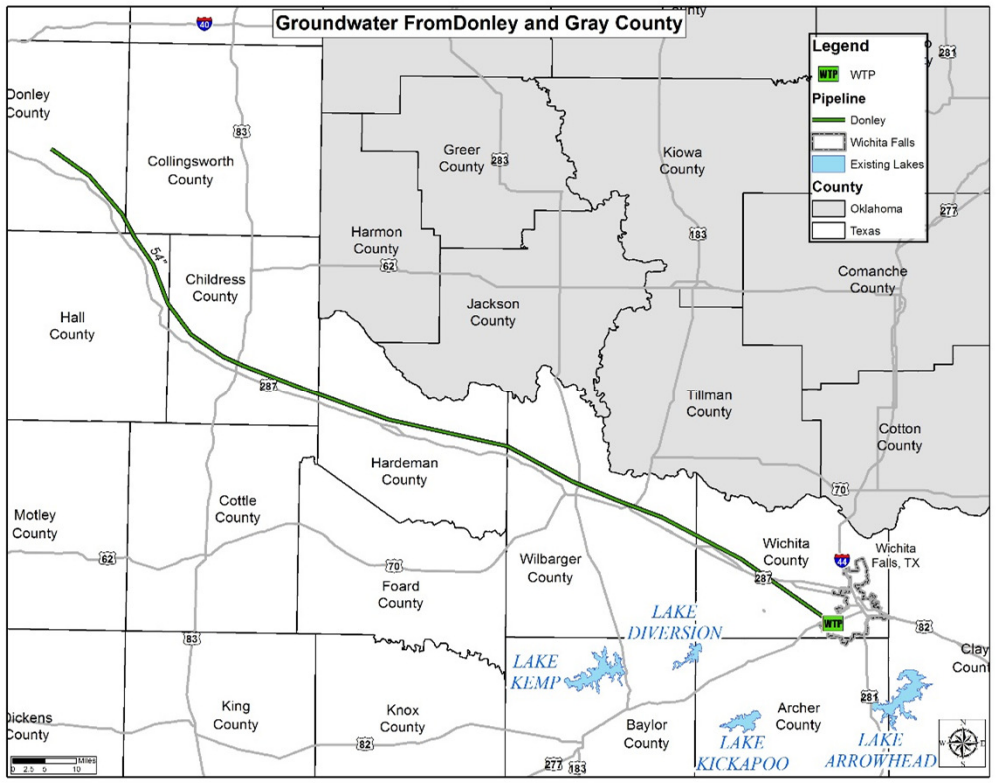


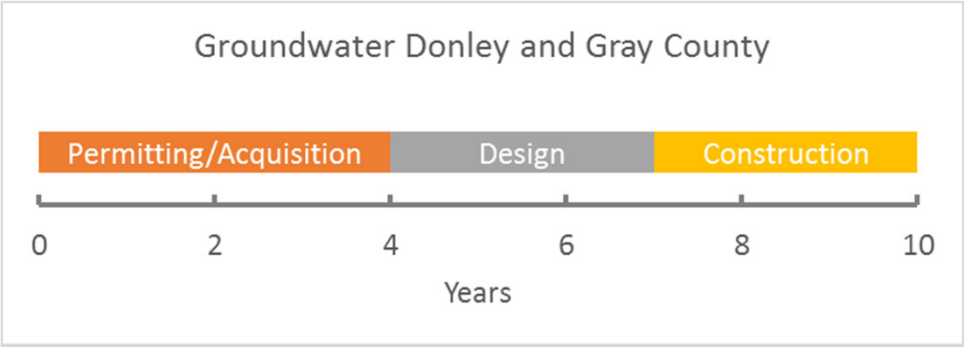
Groundwater Wilbarger County



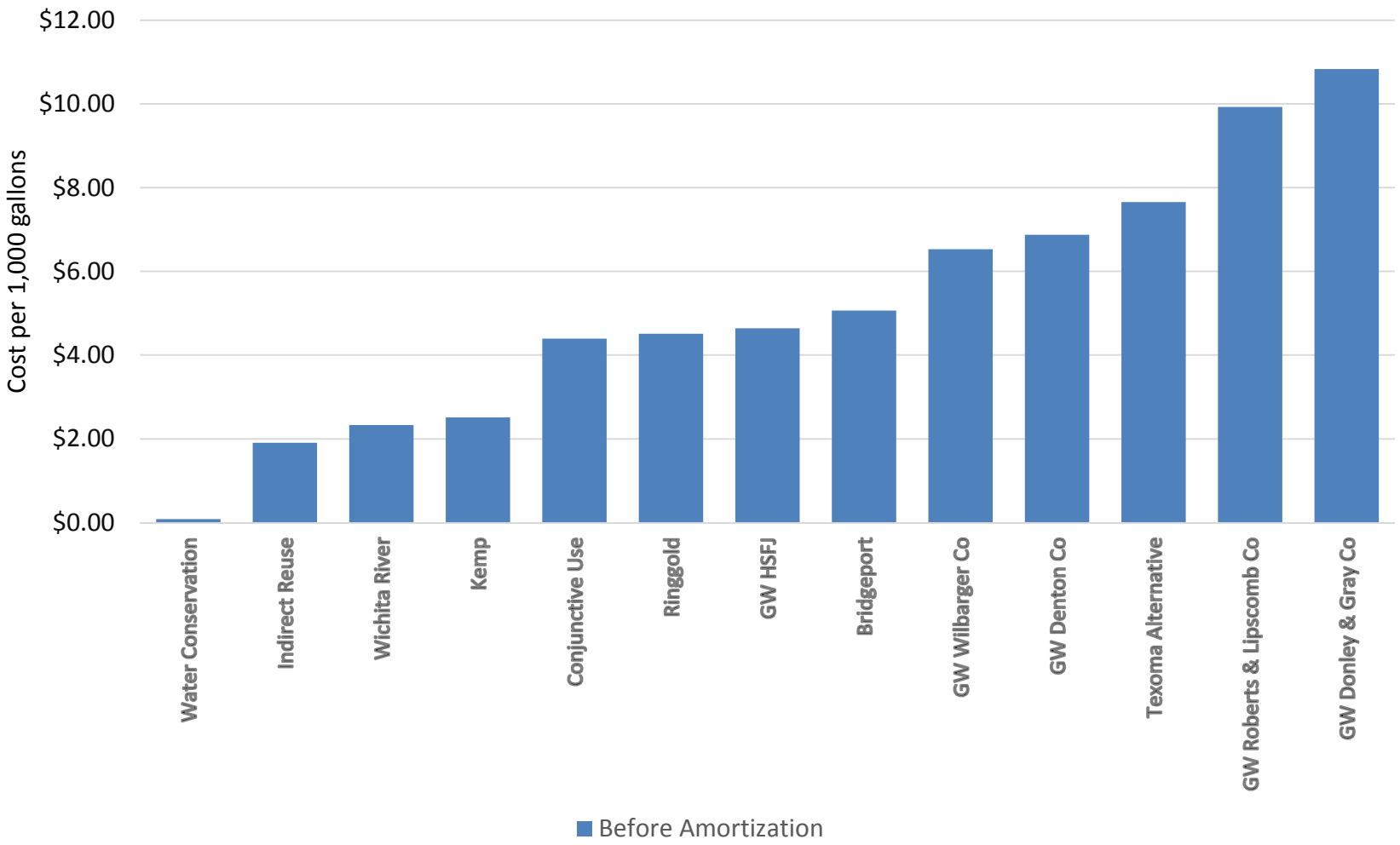
GW Donley and Gray County

- Strategy Supply
  - 15 MGD
- Time to Implement
  - 10 Years
- Capital Cost
  - $628.3 Million
- Unit Cost
  - $10.83/1,000 gallons
- Issues
  - Permitting (GCD)
  - Maintenance





Alternative Analysis - Costs

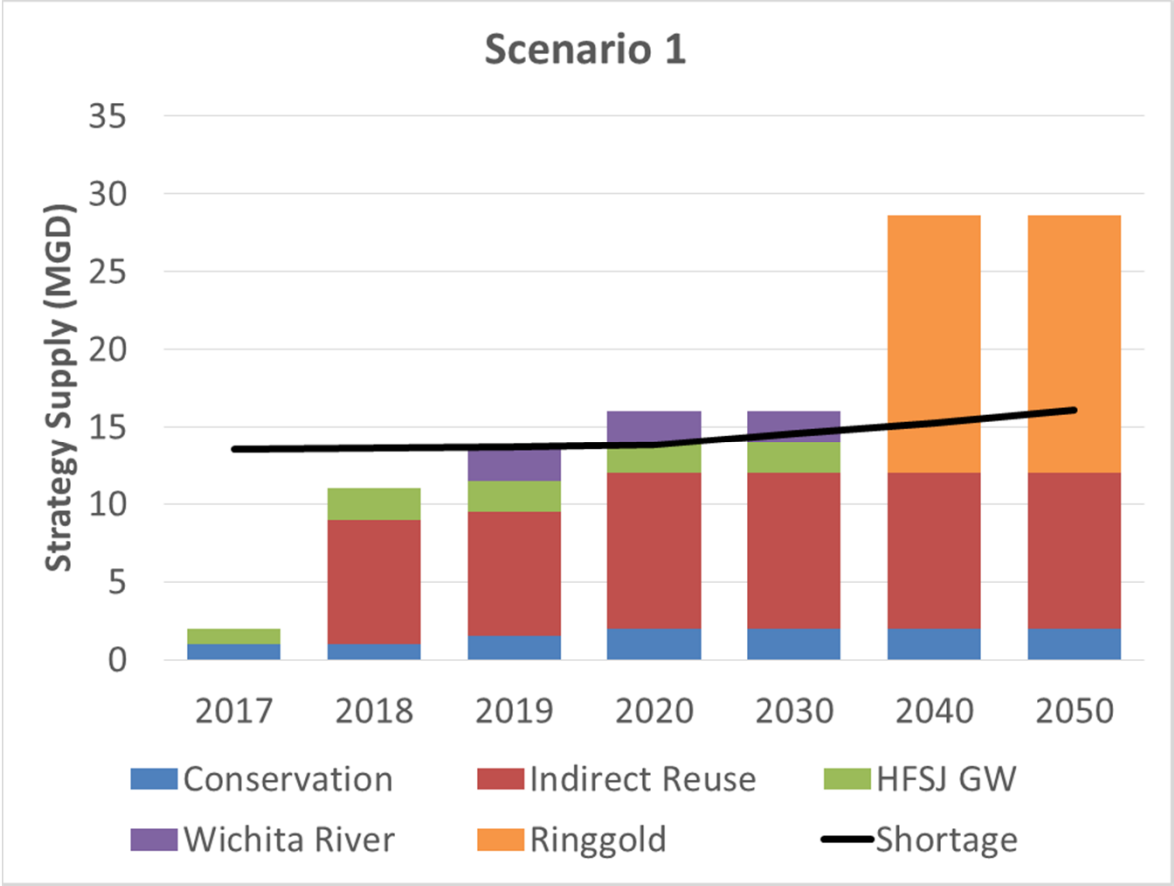


Findings of Strategy Evaluations

- Conservation and Indirect Reuse - best short-term options
- Supply reliability of other short-term strategies is uncertain
- Strategies closer to Wichita Falls – more economical
- Lake Texoma and Ogallala groundwater – most reliable, but most expensive

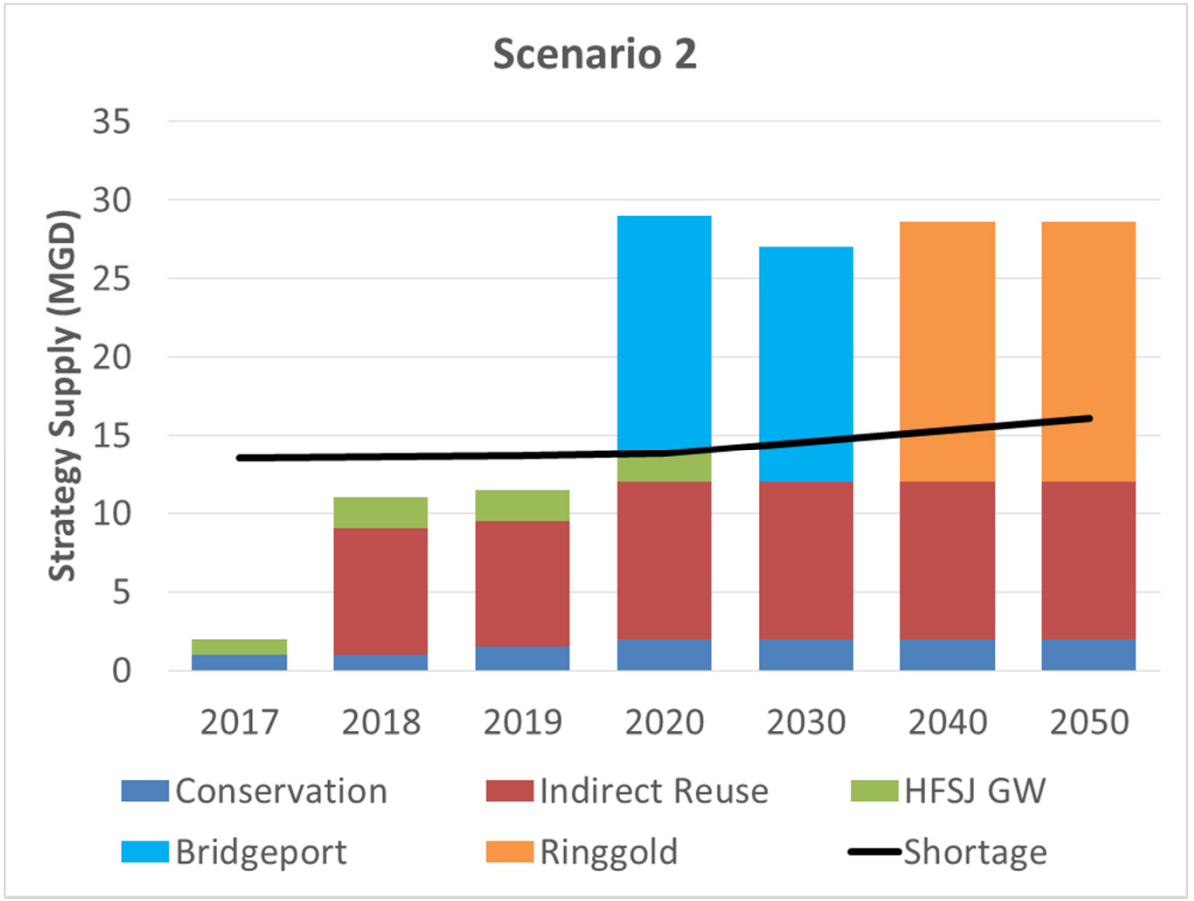
Scenario 1 – Local Water Sources

- Indirect Reuse and Conservation
- Local Groundwater and Wichita River
- Lake Ringgold



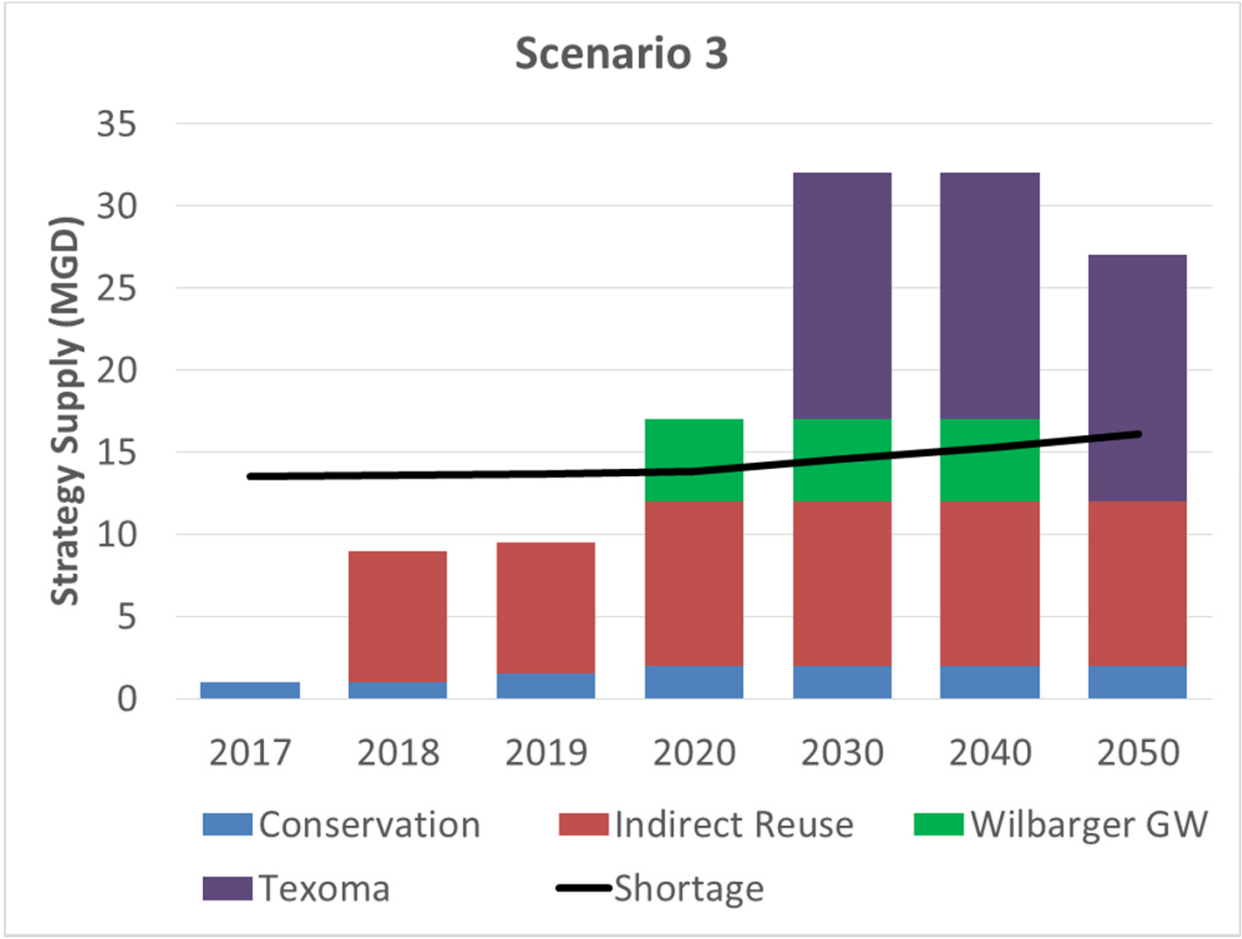
Scenario 2 – Interconnection with TRWD

- Indirect Reuse and Conservation
- Lake Bridgeport
- Lake Ringgold



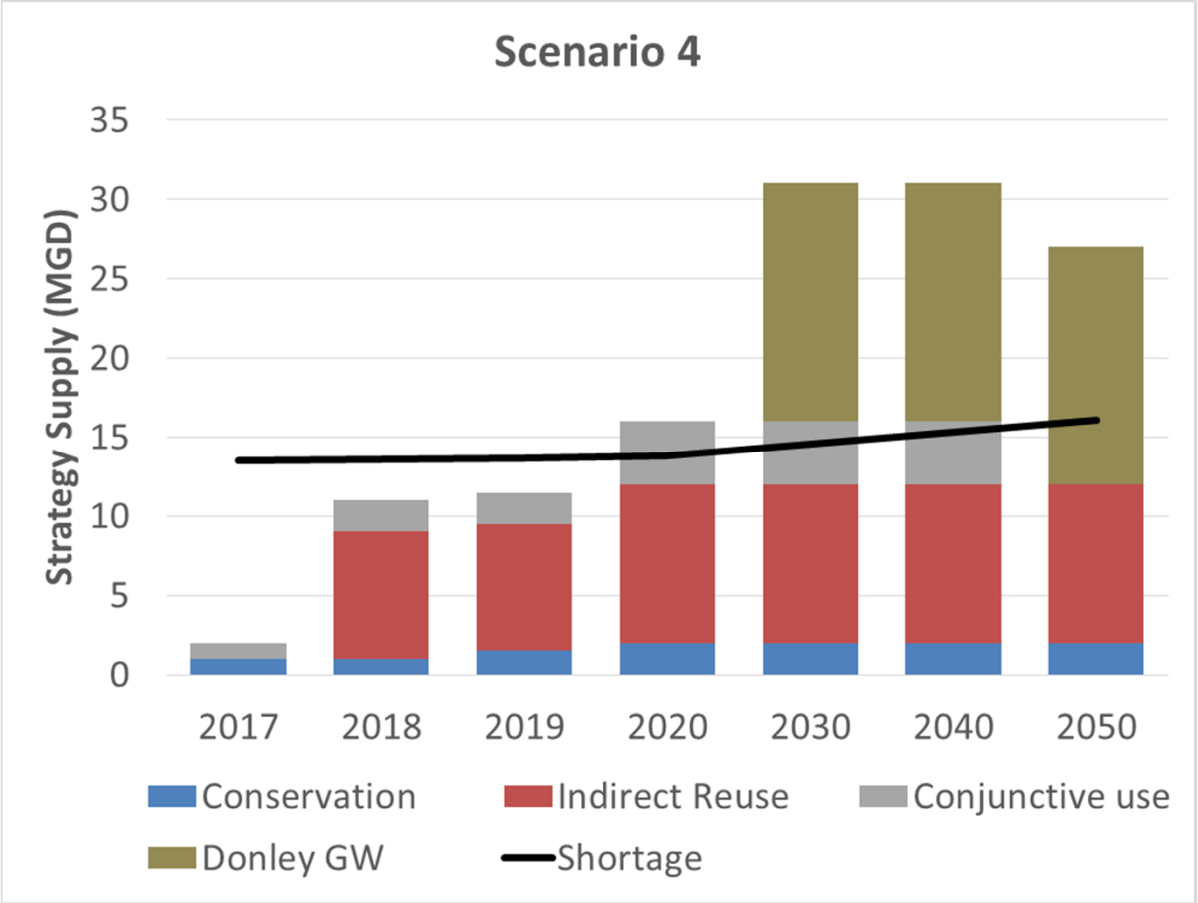
Scenario 3 – Minimum Regulatory Concerns

- Indirect Reuse and Conservation
- Wilbarger County Groundwater
- Lake Texoma

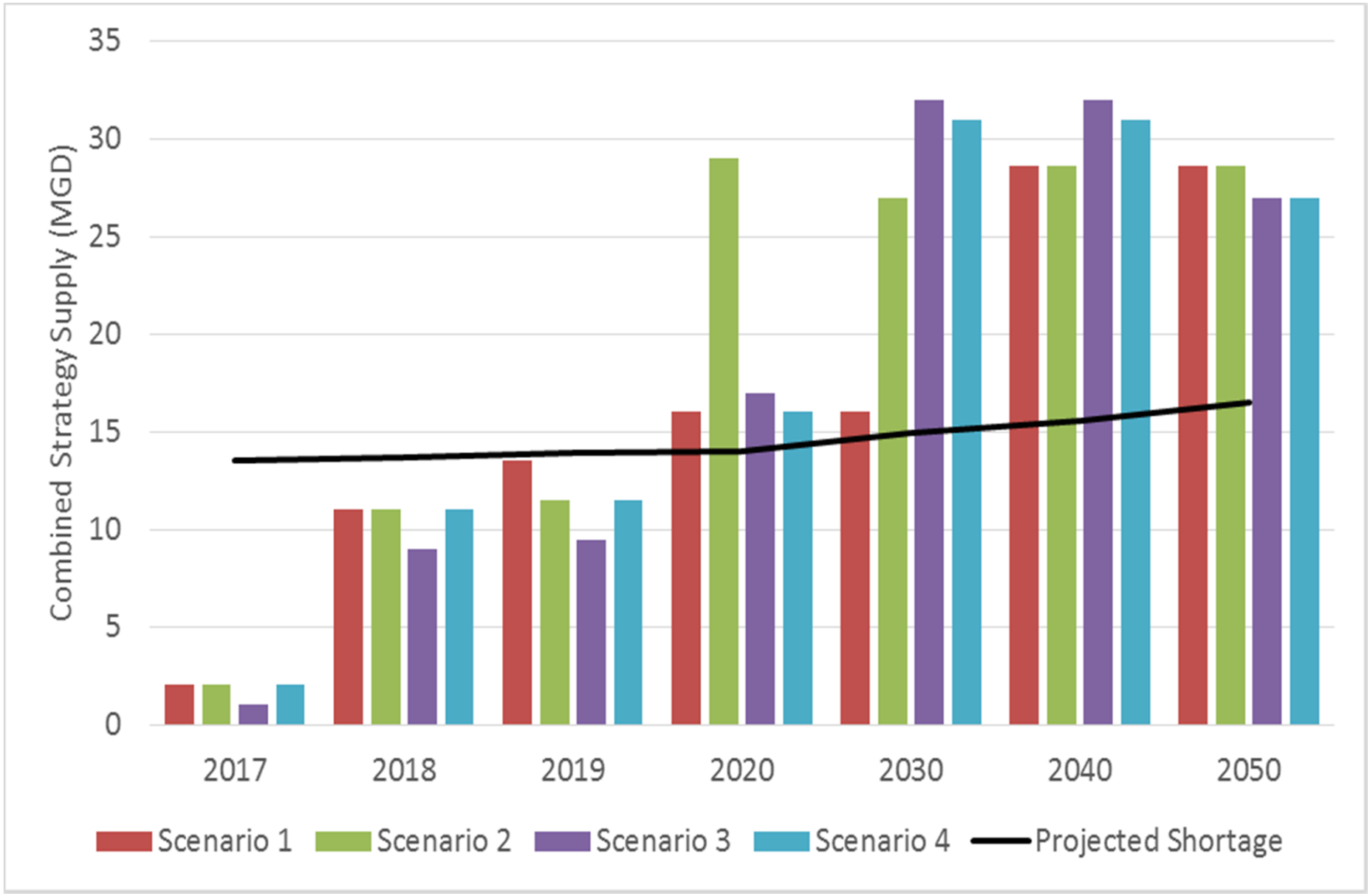


Scenario 4 – Large Groundwater Supply

- Indirect Reuse and Conservation
- Conjunctive Use (Local groundwater and river)
- Groundwater
  - Donley County

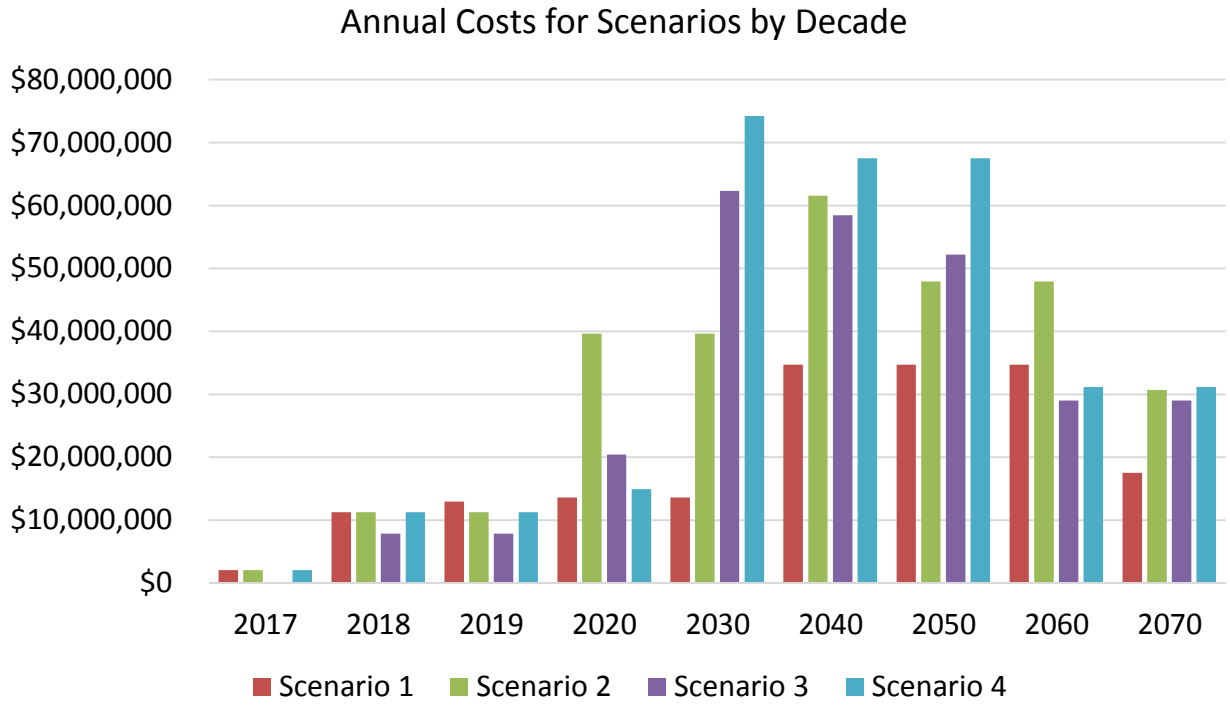


Scenario Comparison



Scenario Analysis

Scenario	Components	Total Capital Costs	Unit Cost in $ per 1,000 gallons		
			Minimum	Average	Maximum
1	Local GW, Wichita River, Lake Ringgold	$364,194,000	$1.77	$3.11	$5.64
2	Local GW, Lake Bridgeport, Lake Ringgold	$588,984,000	$2.66	$4.25	$6.30
3	Wilbarger GW, Lake Texoma	$543,810,000	$2.17	$3.83	$5.68
4	Conjunctive Use, Donley Co. GW	$701,790,000	$2.61	$4.55	$7.36



Scenario Analysis

1. Scenario 1 - Local groundwater, Wichita River, Lake Ringgold
   - **Lowest cost, closest proximity**, least supply independence
2. Scenario 2 –Local groundwater, Lake Bridgeport, Lake Ringgold
   - Requires agreement with TRWD
3. Scenario 3 – Wilbarger groundwater, Lake Texoma
   - **Least permitting, shortest time frame for long term supply,** high costs, water quality concerns
4. Scenario 4 – Conjunctive Use, Donley County groundwater
   - **Greatest supply independence,** high cost, maintenance concerns

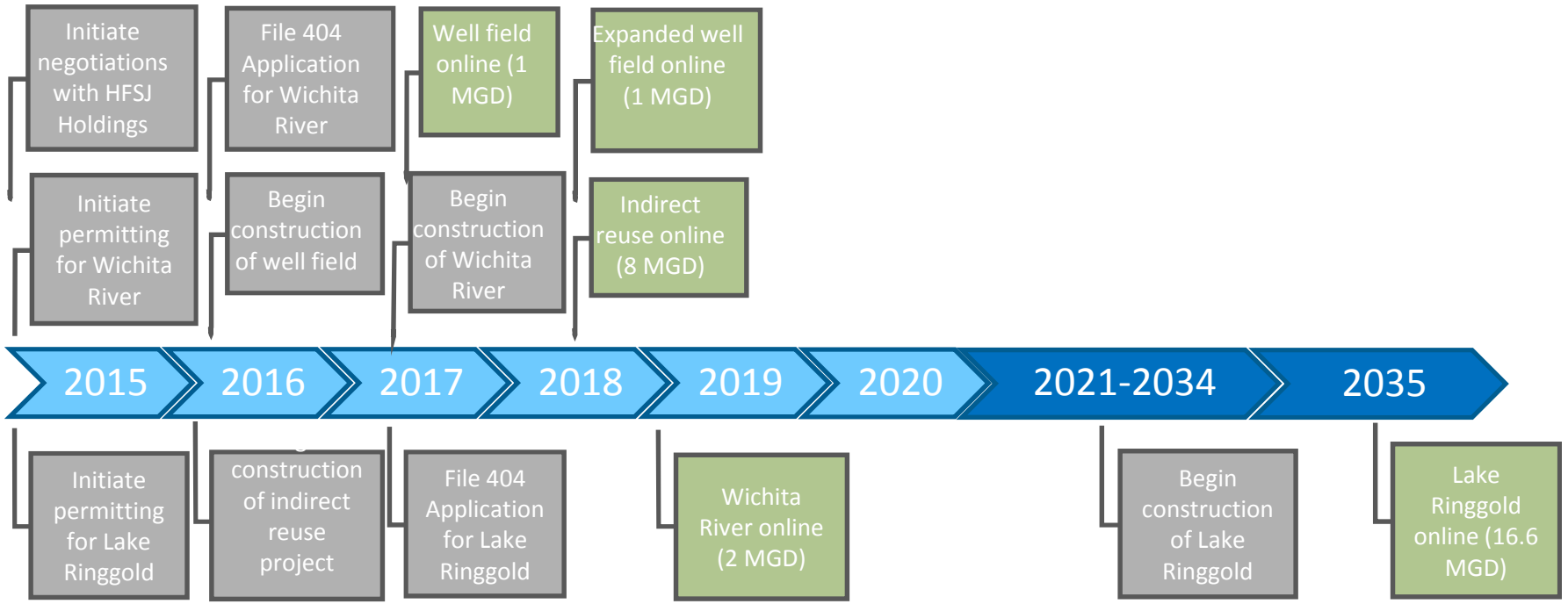
Recommendations

- Implement Scenario 1:
  - Continue developing Indirect Reuse
  - Initiate permitting for Wichita River and Ringgold
  - Continue negotiations on local groundwater
- Continue to explore immediate drought responses
  - Extend use of DPR
  - Brackish groundwater study

Recommendations

- Continue to monitor available supplies for short-term strategies
- Review current wholesale contracts
- Consider a comprehensive joint operation plan for Lake Kemp with WCID #2
- Consider appropriate adjustments to this water supply plan as more information becomes available

Timeline for Recommended Scenario 1



Questions and Discussion